WEAVER
The RANET Newsletter

Editorial: Welcome to Weaver

We've said it was coming. We've said we would do it. And with a little delay, it's finally here! It's the first issue of a newsletter dedicated to RANET – *Weaver*.

What is it? Weaver is intended to provide updates, community discussion, and general information regarding the use and development of the RANET program. Some of the content will address the needs of more advanced users and system developers, while other articles and discussions will cover the basics of the system and RANET activities. Most importantly we hope everyone will provide editorials and updates on their experiences so that these can be shared with the entire RANET community. The information provided in the technical section is a reflection of questions and comments on the technology used, however we know that there is a need to discuss things other than the technology, so we hope you will provide information on your activities and thoughts, or at least request a discussion on a specific topic related to information access and dissemination.

Why weaver? We considered calling the newsletter "connector", "network", and a variety of other names, but in the end we felt "weaver" best summarized the challenge faced by those attempting to increase the access of rural populations to weather and seasonal information. The solution requires the integration and weaving of technologies, information and products, institutions, cultural understanding, and many other issues. We will obviously provide discussion and information as it relates to RANET, but certainly any discussion on the dissemination of information is welcome.

Currently *Weaver* will be produced on a monthly basis, and we plan to have the following sections – Editorial, Experience, Updates, Highlights and Technique. Of course as a community newsletter we are open to adding or changing the content of Weaver, and expect there will be an organic evolution to its content and form.

The editorial section is just that – an editorial on an issue or development related to RANET. The production group of *Weaver* will fill the editorial gap when necessary, but of course your editorials will help keep *Weaver* relevant, while also giving it breadth in vision and topic.

The experience section is meant to relate the positive or negative experiences of RANET activities, as well as similar activities from which the RANET community can draw lessons. In short it is a section for case studies. There is not an experience section in this first issue, but it will begin in the September edition.

The update section simply provides updates on activities and available resources that are of potential interest to RANET participants. We will not be able to know everything that occurs, so please send us any items you think should be in the update.

CONTINUE: Editorial, Welcom to Weaver

The highlights section will provide a quick notice on new content or activities of RANET, and finally the technique section provides small articles on methods, solutions, and reviews of the technology used by, or of interest to, RANET.

In this first issue, readers will notice that most of it is dedicated to the technique/technical discussion, but we hope this is not always the case. For the first issue, however, we felt there were some common questions being asked (particularly regarding the WorldSpace system) that needed some answers, and so we chose to have a significantly long technique section.

For all the sections of future issues please send us requests, or produce an item to be included in the newsletter. While the newsletter is currently in English, we are exploring translation options. If you provide an editorial or article to Weaver, and can provide it in multiple languages, please do so. We will include both translations in the newsletter.

To provide us with requests, suggestions, or actual material to be included in the newsletter, send an e-mail to weaver@ranetproject.net, fax +01.301.427.2082, or phone +01.301.427.2089ext.194.

-K Sponberg

UPDATES

RANET at the WSSD
From August 26 to September 4 of 2002, the international community will meet in Johannesburg, South Africa for the World Summit on Sustainable Development. The summit will host "tens of thousands of participants, including heads of state and government, national delegates and leaders from non-governmental organizations (NGOs), businesses and other major groups to focus the world's attention and direct action toward meeting difficult challenges, including improving people's lives and conserving our natural resources in a world that is growing in population, with ever-increasing demands for food, water, shelter, sanitation, energy, health services and economic security." (http://www.joburgsummit2002.com)

RANET is fortunate enough to have an exhibit at the upcoming summit. Sponsored by the US National Oceanic and Atmospheric Administration, RANET will have a panel exhibit with supporting brochures and documentation. It is a great opportunity for various NGOs and governments to learn about the activities of RANET and potentially develop new partnerships. RANET will provide more details on the WSSD on its website within the next week, however you can view the brochures created for the summit under the library section of the RANET website (http://www.ranetproject.net).

Upcoming Training: RIPI 2
In February and March of 2002, RANET held its first RIPI (RANET Internet Presence Initiative) training. The RIPI program and training is intended to provide the national meteorological services of Africa with the capacity to produce web-based content. The content can then be further delivered to NGO, community, and other RANET partners via RANET's digital satellite broadcast or through existing networks. After completing the training, participants are provided with commercial web hosting for purposes related to the meteorological service, as well as that of RANET, hence "Internet presence." An example website created from the last training is http://www.meteo-uganda.net.

In addition to Internet and web development techniques, the RIPI workshop also provides training on the use of other technologies that are a part of the RANET system. Generally, there is also time to visit local community centers using the same or similar technologies, thereby giving participants a better understanding of how to develop community programs.

Finally, aside from improving technical capacity within meteorological and related services, these trainings have become a great way to build the RANET community and share experiences related to the use of ICTs in Africa.

Following the success of the first RIPI training, RANET now hopes to hold three workshops a year. The next workshop is planned for early November of 2002 and will be held in Niamey, Niger at the African Center of Meteorological Applications for Development (ACMAD). The training is targeted at meteorological or related national services, however other interested groups should contact ACMAD or send an e-mail to ranet@ranetproject.net for further details and to determine available space at the workshop.

TECHNIQUE

WorldSpace Adapter Cards

The WorldSpace system serves as one of the main arteries of RANET to deliver content to rural areas in Africa and parts of Asia. Akin to a one-way Internet, the satellite broadcast delivers downloaded content directly to a computer hard drive, where information can then be viewed at leisure through the use of Internet Explorer, Netscape, or another standard browser. The equipment involved in the system is a WorldSpace compatible digital radio receiver, a PC Adapter Card, and the user's Windows based computer.

While the equipment for the system is relatively inexpensive (~$100 - $200 USD) for a satellite distribution system, and requires little technical expertise to setup and use, you should be aware that several different PC Adapter Cards are available and may not be compatible with certain Windows systems.

The SPCA, known to many of the first multimedia users of the WorldSpace system, are no longer commercially available, but the SPCA is still often distributed through the WorldSpace Foundation, RANET, and other content providers using the Africa Learning Channel Data broadcast – known as the ALC DATA. The ALC DATA is the multimedia broadcast of the WorldSpace Foundation dedicated to issues of education and development.

> *Advantages:* It is a tried and true adapter card that is relatively straightforward to use. It comes with its own installation software, which is generally pretty stable and easy to install, and it will work with Windows 95, 98, and NT systems. The SPCA will also work on Windows 2000, however users should be aware that on the 2000 system we've sometimes noticed erroneous warning messages regarding disk space. Then again this may just be us. If you use it on a Windows 2000 machine, you will need to be vigilant about ensuring your hard drive has plenty of disk space. One way to protect hard disk space and the overall integrity of your system is to set the cache setting in the Client Services software to "7-days," instead of "forever". [See the Client Services article -- To Cache or Not to Cache in this edition of Weaver.]

> *Disadvantages:* If you are simply using the system to receive RANET content, as well as other information distributed on the ALC DATA, there really aren't many drawbacks to the SPCA. However, if you want to receive subscription services provided by the WorldSpace Corporation, you will need to upgrade to the DDA (the 128kbps adapter card). The major disadvantage of the SPCA is that it is the only adapter

card to require a separate power source, which in community settings can be a significant issue and burden. Even if a power source is available, it is often awkward to find enough power outlets to support a digital receiver, adapter card, as well as a computer and monitor. If you are setting up an SPCA, be sure to bring extension cords.

A final disadvantage with the SPCA is the content viewer which comes with the adapter card. We've received numerous reports about the content viewer crashing and hanging up, particularly on older machines. A solution around this, however, is simply to use the ALC Content Viewer.

The DDA is the latest external PC Adapter Card provided by the WorldSpace Corporation. It is rated to receive a 128kbps broadcast from any of the WorldSpace satellites, but as both the ALC DATA (Africa) and WSF DATA (Asia) channels operate at 64kbps, the expanded capacity does not enhance or improve the RANET download.

> *Advantages:* The main advantage of the DDA for RANET users is that it does not require an external power source. As it uses a USB port, you simply plug it in to your laptop or desktop Windows computer. Not only is this an advantage in situations where power is an issue, but frankly it saves you the headache of finding another power outlet close to your receiver and computer. The software that comes with the DDA is also a bit more stable – in particular the content browser is a significant improvement over that distributed with the SPCA.

> *Disadvantages:* While the DDA connects to your computer via a USB port, and therefore does not require an external power source, the fact that it requires a USB port may limit you to newer computers. Additionally, you are more system limited with the DDA, as it only works, currently, on Windows 98 and Windows 2000 machines. To date the DDA and associated software do not support Windows XP, which may be problematic for users buying a new computer.

> We also have to warn all Windows 2000 users that before installing the DDA software, ensure you have the original Windows 2000 installation CD on hand. When you install the supporting software for the DDA, at the end of the installation process you will be required to insert the Windows 2000 installation CD to add/replace some drivers. If you don't, you will likely run into problems with the WorldSpace system.

The Internal PC Card is relatively new innovation of WorldSpace, which simply combines the radio receiver and adapter card into one unit. As the name implies, it is an internal card that can be installed in your desktop computer on a PCI slot, as you would a video, audio, or additional card.

> *Advantages:* The Internal PC Card is really wonderful. It doesn't require an external power source, and the associated software with it is quite stable and easy to use. Perhaps the greatest advantage is that it allows users to listen to an audio channel, while also downloading a data broadcast. As the DDA and SPCA external PC Adapter Cards are used with a WorldSpace receiver, you are limited to downloading only one channel at a time. So if you are listening to news or music, you won't be downloading data content. By allowing the user to listen to audio content and a data channel, you can pretty well be downloading 24x7 as the data download process does not tax your computer significantly. The Internal PC Card makes it easy to stay up to date.

> Disadvantages: The significant disadvantage of the Internal PC Card is psychological in nature. As you have to install this into a computer, it means cracking your desktop open. For users who haven't done this before, it can be intimidating. Moreover, the average user may not be as careful as necessary to protect the inside of the computer from static shocks and dust.

> Another disadvantage is in the cards portability -- its not very. As it requires a PCI slot, there is not a way to integrate the Internal PC Card with laptop computers. And while you can move the card from desktop to desktop, this is obviously not something you want to do on a daily basis.

Know Your BCIDs: Broadcast Channel Identifications

Users of the WorldSpace system take note. It is easy enough to tune into the ALC DATA or WSF DATA channels when using the Hitachi or another radio model that displays the WorldSpace channel name. For instance RANET is carried on the ALC DATA channel in Africa. Rather than a number appearing, the channel name actually appears in the radio screen – ie: to receive RANET in Africa you tune the WorldSpace receiver to ALC DATA. Although we have not seen it in practice, we have been told that some models of WS digital radio receiver do not display the channel name, but rather show the BCID – a channel identification number. The BCIDs for the ALC DATA (Africa) and WSF DATA (Asia) are listed below. RANET is carried on both these data channels. For a full listing of audio and multimedia channels visit the WorldSpace website under program guide – www.worldspace.com. Please note that some of the channels may require a subscription service, however the ALC DATA and WSF DATA channels are subscription free.

ALC-DATA (Africa) - 792
WSF-DATA (Asia) - 1190

Good Web Design Is Often Good Economics

When we first learn to create web sites, its common to want to include as many pictures, color effects, and blinking features as possible. The desire to do so is a natural outcome of the creative excitement surrounding web development and the ability to make content available on the Internet. After the initial excitement wears off, however, we often realize that we added unnecessary features and created a site with too much complexity – so at this point its time to consider the design of your site.

There are literally hundreds of books and articles on "good web design." Each often prescribes a set of techniques and rules to follow when creating a site or single web page, and while they are detailed and useful, we think they can be generalized into two rules of functionality. Specifically, is a certain image or interactive feature really accomplishing something that 1) couldn't be done another way, or 2) simply adds value which is worth its size or complexity?

Sometimes the use of images is justified, such as a forecast map or an observation of precipitation or temperature. Simply, there is information within these images that could not be communicated as effectively or quickly with just text. In this case the image is not only functional, but economical. It saves space and time communicating what would take a lot of text to describe, and frankly it may be hard to communicate the same information in a text format that is not subjective or reliant on the author's interpretation.

Of course there are a set of other images, such as logos and banners, which provide another sort of functionality. Specifically a logo, use of color, and layout provides branding and a sense of consistency to a site. Banners and other images, may provide visual clues to help a user navigate your information. Interactive features can give the user a sense of control and interest in your site that would not have been possible with text and images alone.

So while it is easy to justify the use of images and interactive features in order to direct a user's attention, you must consider your audience and weigh if the increase in work for yourself, added bandwidth burden, and complexity of your site is worth the extra attention and visual impact.

If you consider bandwidth alone, this is often reason enough to slim down images or get rid of them altogether. According to ITU statistics, the cost of a local 3-minute call (ie: the cost of connecting to the Internet via phone lines) can be anywhere from $0.10 to $0.30 for many countries in Africa. Time is literally money for many Internet users, so downloading an extra 10 kilobyte image may not be significant alone, but if they have to do this repeatedly on your site, or if you have multiple and unnecessary images on your page, then the seconds soon become minutes. In the end you might inadvertently impose a significant cost to the information you intended to make public. To put that one 10 kilobyte image file in perspective, on a 14.4kbps connection, the image alone will take a little less than 6 seconds to load. While many users may have faster connections, many more in Africa and parts of Asia do not. Imagine downloading a larger file or having to download a page with a total size of 100 kilobytes. Imagine further that your user may have to navigate several pages to get to the content they really want. In the end they may have to download nearly half a megabyte before getting the information they need -- that translates to about four and half minutes of waiting and telephone charges.

While it is good practice to slim down your site, there is no need for drastic measures. Before you strip out all the images from your webpages, consider reformatting the various images to save a few kilobytes here and there. The following are some guidelines:

Image formats.
There are 3 major graphics formats that are supported on the web. These are GIF, JPEG, and PNG.

GIF files are suited to images with large expanses of a solid color. Other examples that are suited to the GIF format would be images that contain mainly text or mainly line art.

JPEG files end with the .jpg suffix and are generally better to use when the image is a photograph.

The third major format is PNG, but since this format is not widely supported on older browsers, it is not in widespread use (yet). It combines benefits of both GIF and JPEG formats, however it is not recommended to use this format since it is not widely supported yet.

Commercial graphics applications like PhotoShop or Fireworks will allow images to be saved as either GIF or JPEG, and will also allow comparison between the two to see which format looks best for a given image at a given file optimization. There are a variety of shareware and freeware graphics applications like GIMP, but be aware that as the GIF format is a patented image compression, many free and share applications will not, or will not legally, support images being saved as GIF. You can of course generally use the Paint program in Windows as a default way to change image formats, including GIFs, but you may not be able to get quite the image quality you want.

GIF files can contain up to 256 colors, and if it is possible to reduce the number of colors in an image, the file size can go down. With GIF files, it is also possible to dither them to get the file size smaller, however the image quality will suffer. You should use GIFs when there are large areas of uniform color and the total number of colors is smaller than 256. A good example of this would be line art, or an image that has lots of text.

JPEG files can be set to a percentage of clarity from 1% (very fuzzy) to 100% (crystal clear). The higher the percentage is, the larger the file size will be. It is usually possible to set the percentage to between 60-85% without any noticeable loss of quality.

The following examples illustrate how you might reduce file size, by simply reformatting your images. The first example shows how the use of a GIF can save considerably on the image size, as well as produce a clearer image.

GIF 3.61K   JPEG 7.61K
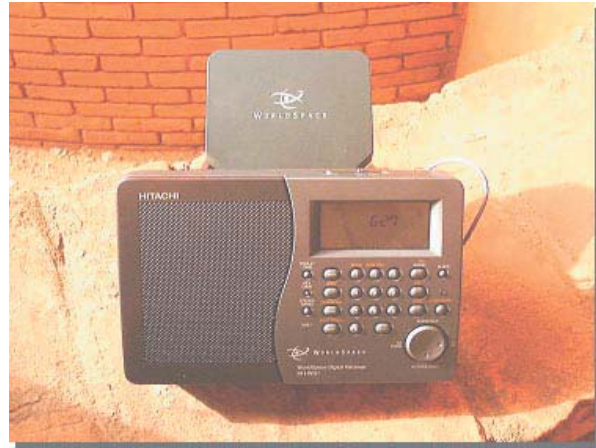

In the next example, you can see that by using JPEG you can make the file size quite a bit smaller, and actually have a better quality image. Again, JPEGs are often more appropriate for pictures, while GIFs are better used for text and images with large areas of solid color.

GIF 49K   JPEG 33.9K

To Cache or Not to Cache?

Some users of the WorldSpace digital radio broadcast receiving RANET content may or may not be aware that you can automatically choose how long to keep downloaded content on your hard drive. For review, the RANET broadcast on the WorldSpace system works by sending Internet browser compatible content (generally HTML) over a digital satellite radio signal. With the use of a special radio receiver and adapter card, information is saved directly to your hard drive where it can be viewed at leisure and without the time delays or expense sometimes associated with landlines. Of course this also means content can be received where no telephone connection exists.

Your hard drive, however, has a limited amount of space. Many new computers come with 20 gigabytes or more of storage, but users of older machines may only have 4 gigabytes to support the operating system, software applications, and their own personal files. With two extremes of potentially lots of storage or very little, the user of the digital satellite broadcast must decide how much content to keep stored on their computer at anyone time. You can use the Client Services "cache setting" to determine when and if content is deleted, but this setting should be a balance of your download habits, as well as the available disk space on your computer.

Generally the entire broadcast of the ALC DATA or WSF DATA channels (that which RANET is carried on) never exceeds 500 megabytes. In short you will never have more than 500 megabytes worth of downloaded content on your hard drive at any one time. Much of the content sent over the system simply replaces older content, thereby limiting the total size occupied on the hard drive.

For new computers, this is not much of an issue. With the likelihood that there are literally gigabytes of disk

storage unused, you could continually download content and never really worry about ever deleting older material that is no longer used or viewable. Older computers, however, may barely have the 500mb necessary.

Rather than deleting content by hand or limiting yourself to certain download periods, you can use the software associated with the WorldSpace system to manage downloaded content – specifically stating when content should be deleted.

You can do this by starting the WorldSpace Client Services software. (Note instructions are slightly different for users of the Internal PC Card.) The Client Services is the program you must start each time to begin downloading the ALC or WSF data channels. When the Client Services starts, an icon will appear in the system tray – generally the lower right of your screen. The icon is a computer and satellite dish with a background that changes from green to red depending upon whether or not content is actively being downloaded.

If you double-click this icon, a new window will appear which allows you to view log files of downloads, actively view the download, as well as set the cache. The cache is simply where the content is downloaded and saved on your computer hard drive. If you go to File Settings in the menu bar, you will see two options. Select the "cache settings" option to open yet another window dialogue. Here you will notice that you can set the cache to save content for one to seven days or to forever. Which should you choose?

It really depends upon your downloading habits. RANET content, as well as the other material sent over the ALC or WSF data channels, is broadcast in small amounts, meaning that you are not downloading all the RANET content, but rather updates, and some core material. Content is rotated on a regular basis to ensure that most of not all the content is received. Some content is given higher priority, while other material (such as unchanging documents and reports) are sent less frequently. If you download for several hours a day, then you are likely to receive all the RANET content, as well as that broadcast by other content providers. The ALC is currently broadcasting on a 6 hour rotation, meaning that content is rebroadcast ever six hours, however RANET broadcasts at the beginning of every hour and so is constantly updating and rotating content in and out.

What does this mean? Well, if you only download for short periods or only once or twice per week, and if you have the cache setting deleting content every two days, then it is likely material will be deleted before you can view it, or more significantly the files necessary to view downloaded content will be deleted. For instance if you set the cache setting to delete files every two days, then if you have completely downloaded everything on a Friday, by the time you revisit the system on Monday, everything will have been deleted and you will need to download everything anew.

Generally, we recommend that all users set the cache setting to seven (7) days. If you are on an older computer with limited disk space, then you may need to set your cache settings to every 4 days or something similar, however, in this case you will then need to be more vigilant about downloading on a daily basis and for several hours, if you want to ensure you have the most recent content and all the files necessary for viewing downloaded material.

Some users with a lot of excess disk space, and who download infrequently, may be ahead to set the cache to "forever", but perhaps once a month, it is a good idea to set it to six or seven days in order to delete content that is now obsolete and not accessible via the content viewer.

There is another feature in the "cache setting" option that is extremely important. Specifically you can set a warning to automatically be displayed when the available disk drive space goes below a certain amount. This should be set to at least 300mb, if at all possible. What this will do is tell you when your hard disk has only 300 megabytes of space available. If you receive this warning its time to start deleting old content and unnecessary files, and certainly do not continue downloading content until you have cleared enough space. If your hard drive ever gets completely full and you continue to download material, then there is a chance you will overwrite your own personal files, computer programs, or worse yet, the operating system.

Managing your download and cache of material is not a difficult process, but it does requires balance of your downloading habits, information needs, and overall disk size. Communicating this to users of the system may save you time by letting them know how to manage their own system.

Weaver is the RANET newsletter providing updates, sharing experience, and providing technical tips to RANET participants.

The newsletter is compiled and edited by the Climate Information Project as a contribution to RANET. The CIP is supported through the NOAA-Office of Global Programs, and the USAID-Office of Foreign Disaster Assistance.

Views and opinions within Weaver do not necessarily reflect those of NOAA or USAID, but are rather intended to inform and reflect the RANET community.

WEAVER

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"Subscription" Information

Weaver is made openly available on the RANET website at: http://www.ranetproject.net, and is broadcast over the RANET digital satellite radio service in Africa and Asia, which is supported through the WorldSpace Foundation.

Readers can receive Weaver via e-mail by sending a request to weaver@ranetproject.net or signing up via the RANET website: http://www.ranetproject.net/weaver